Before the

Federal Communications Commission

Washington, D.C. 20554

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TO: Chief, Wireless Telecommunications Bureau

REPLY COMMENTS TO RM-11392

The recommendation(s), analysis, and detailed comments outlined below are in opposition to those of the petitioner, Mr. Mark D. Miller as submitted in RM-11392 for consideration by the Commission.

In lieu of ***reducing*** allowable bandwidths for various digital modes of operation, it is important that the Commission continue to support technical innovation within the amateur radio service. The Commission has long held the published viewpoint, quoted in part from PR Docket 88-139, as follows:

> ***"We wish to recognize and encourage the experimental nature of the amateur service. It is appropriate to avoid, to the extent possible, placing in the Rules detailed regulations and specifications for the configuration and operation of various amateur communications systems. Such regulations and specifications would reduce the flexibility that is the hallmark of a service free to branch out and follow an infinite number of paths… This enables amateur radio operators to utilize their individual stations in creating and pioneering communications systems that are limited only by their personal interests, imagination, and technical skills."***

The recommendation and bullet-points to follow will outline the basic position of this paper which this author is submitting in response to RM-11392. Additional observations and detailed comments in support of this recommendation are provided farther down in this document.

INTRODUCTION:

The amateur radio service has evolved in a significant manner between 1988 and the present day with respect to innovative and advanced modes of communication other than basic voice and Morse code operations.

As of February 23rd 2007, knowledge of Morse code is no longer a requirement for members of the amateur radio service. Perhaps this phrase should be repeated, for the benefit of those reading this public comment online:

"Knowledge of Morse code is no longer a requirement for members of the amateur radio service."

As of February 23rd 2007, the radio frequency band plan published by ARRL Headquarters has redefined the mixed "CW" and "data" portions of the amateur radio spectrum as "RTTY/Data". A copy of this plan is attached.

It is important to note that this reply paper is ***not*** advocating the elimination of Morse code. Instead, this response is presenting a wider-scope view that the amateur radio service is now on the threshold of a major paradigm shift in emphasis which is only just now occurring as part of this public debate.

The growing pains being experienced within the amateur radio community today with respect to new technologies are exactly similar to two other major events in the recent history of the amateur radio service:

1. The transition from AM to SSB voice operations in the amateur radio HF spectrum during the early and mid-1950's.

2. The amateur radio 2-meter VHF band was predominantly that of AM modulation in the late 1950's through the early 1970s utilizing crystal-controlled "Benton Harbor Lunchboxes" which were used by individual amateur radio operators. In addition, the venerable "Gonset Communicators", of this nation's "Cold-War Era" were procured and issued in quantity to the amateur radio community via various Local, State, and Federal Departments of Civil Defense.

   During the mid 1970's, radio amateurs started adopting the use of land-mobile FM radios for use in the 2-meter band which had been surplussed from business-band and local government communications users as they were adopting narrower-bandwidth FM technology pursuant to updated Part90 rules [from +/- 15 KHz FM deviation, to +/- 5KHz FM deviation].

The "growing pains" resulting from these advances were considerable, with members of the amateur radio community being very vocal in favor of, and in opposition to, these developments. Nevertheless, the amateur radio service moved forward with the transition from HF, A.M., to HF SSB voice communications, and moved forward with the transition in the VHF 2-meter band from amplitude modulation to frequency-modulation.

Of special importance was the need in the 2-meter band to have assigned channels for massive numbers of mountain-top FM radio repeaters. To facilitate this change, the amateur radio community, in coordination with the ARRL and the FCC, created recognized frequency coordinating bodies within the various regions of the United States. These organizations, patterned in a manner similar to the regional chapters of the "International Association of Public Safety Communications Officials, Inc." (APCO), manage the growth of these systems, resulting in today's existence of a major investment in VHF & UHF repeater systems to support the fixed, portable, and mobile radio communications activities of the amateur radio community. It is with this history, and supporting comments below, which provide for the recommendation outlined in the next portion of this reply comment.

RECOMMENDATION:

- Expand the currently-adopted band which went into effect under Part97 on Feb 23rd, 2007 to include the following expanded segments of the amateur radio service spectrum for RTTY/Data communications:
    - 3500-3625 KHz
    - 7000-7125 KHz
    - 14000-14099 KHz
    - 14101-14150 KHz
    - 18068-18110 KHz
    - 21000-21200 KHz
    - 24890-24930 KHz
    - 28000-28300 KHz

- All portions of these expanded "RTTY/Data" sub-bands would be available to all amateur operators holding privileges of General Class and higher. Existing Novice and Tech+ licensees may operate within these expanded RTTY/data sub-bands via CW mode only.

- Some segments cited above, are slightly larger than in previous recommendations by the League, and others, due to growth within the amateur radio service and the adoption of new modes of communication supporting formal message traffic systems, or file-transfer modes, requiring more than 1.5 KHz of occupied bandwidth. There is also an explosive growth in the area of live-chat, digital communications, between attended stations utilizing a variety of narrow, and medium-bandwidth emissions for the purpose of low and medium-speed, live-text chat at rates up to approximately of 100 words per minute.

- By general agreement, modes requiring higher bandwidth than others would be encouraged to operate in the higher-frequency portion(s) of the segments listed above, through band plans coordinated by organizations and the Amateur Radio Service licensees themselves.

- Winlink2000, and other similar or future systems, responding to connect requests from operator-attended stations, and other such nodes requiring connection to a distributed infrastructure for the purpose of passing internet email and message traffic between originator and recipient will not be defined as "automatically-controlled" stations, however these stations will also operate in the upper section(s) of the RTTY/Data sub-bands.

- Operating frequencies for Winlink2000 and other similar or future communications networks, relying on specific channel assignments for efficient transport and delivery of message traffic, will have their operating channel frequencies coordinated, published, and protected from interference in a manner similar to frequency assignments of amateur radio FM repeater stations.

    - This recommendation is, in essence, identical to the current practice of ARRL headquarters station W1AW which operates on published HF frequency assignments on most HF amateur radio bands. By general agreement within the amateur radio community, such scheduled broadcasts on published frequencies are considered proper and constructive to the amateur radio community for reliable dissemination of bulletins, and news, which is of importance to the amateur radio community. Furthermore, amateur radio operators accommodate such broadcasts by moving their own operations to another frequency when W1AW bulletins commence.

- Support the continued use of time-efficient modes such as the PACTOR-III, and FED STD 1045 Automatic Link Establishment (ALE), and other protocols for use within the amateur radio service. Also, encourage the adoption of file transfer modes such as, but not limited to, the Milstd 188-110 modem protocol, which are interoperable with military, government agencies, and commercial services.

The recommendations above are based on the detailed information presented below.

CURRENT SITUATION

After reading *all* of the posts related to this proposed rule-making on various amateur radio internet forums, and reading **all of the formal replies** to petition RM-11392 that were posted on the FCC's comment site so far, the important major issues voiced by individual amateur licensees seem to be along the following lines:

The amateur radio “Winlink2000 System” (Winlink) is a nationally installed infrastructure asset that is of critical value for disaster recovery-related communications to and from an area which has experienced a major loss of telephone/internet, land-mobile radio, cellular telephone, television or radio broadcasting infrastructure due to the disaster.

Specific examples of major impact to commercial and governmental infrastructure are the recent hurricanes Katrina, and Rita. Winlink requires the use of specific channel frequencies for it to function. The Winlink network allows for very fast processing throughput under favorable HF radio propagation conditions when it can ramp up to wider-bandwidth modes in order to pass traffic more efficiently.

Time periods when propagation is best on a particular HF radio frequency, are also congruent with a significantly greater use of the same HF band by all amateur radio users, and at these same points in time, a Winlink path between specific client users in the field and Winlink base stations will ramp up to wider bandwidth in order to pass email traffic as quickly as possible.

When there is no major disaster or emergency, the Winlink system is a viable means of global communications for amateur radio operators who are land-mobile, marine mobile, or operating from portable and/or temporary locations.

Use of the Winlink system on a routine basis by amateur radio operators who are mobile, portable, or at temporary locations, for internet-based email communications will keep users current with operating skills and with needed software updates to their client software (Airmail) .

There is a subgroup of the amateur radio community holding strong and vocal opinions, such as:

- "Winlink is not needed in the amateur radio community for internet email, since we have computers and internet connections available to us, which do not require the use of a radio. "

- “Internet email doesn't belong in the amateur radio service, since we are using radios.”

- "Amateur radio operators don't **own** specific radio frequency assignments, therefore I'm going to operate next to these dedicated Winlink stations and then when it is activated to pass traffic, I'm going to complain about interference and may even just jam the Winlink base station because I was operating on this frequency first!!”.

- "The amateur radio community has all these specialized modes that I have no interest in, so they shouldn't be in operation and causing interference to my hobby..."

- "Nobody needs these wideband modes anyway when we have perfectly valid narrow-band digital modes in which I can use cheap or free software, and an existing computer that does not require a dedicated hardware TNC that runs G-Tor, Pactor-I , Pactor-II, or Pactor-III data modes.”

DETAILED COMMENTS

My response to the current situation outlined above is as follows:

The amateur radio service is a hobby, a recreational activity, and a competitive sport (if contesting is viewed in this manner). The amateur radio service also exists ***in the public interest** and provides a pool of trained communications volunteers who are able to support their communities in the aftermath of a major disaster. In non-emergency mode, the amateur radio service regularly supports various public service events of many types.

The amateur radio service is unique in that, in general, "channelized operation" is not required. Radio amateurs are able to utilize many types of communications modes, emission types, and large segments of the HF radio frequency spectrum with little direct oversight being required by government authorities, provided that members of the amateur radio community show respect and consideration for one another as part of their collective involvement in a very technical and non-commercial activity.

As Riley Hollingsworth stated at a recent amateur radio convention at our "Pacificon", Pacific Division Convention a few years ago: [paraphrased]

> “The amateur radio service can be viewed as a public playground. Every city and town has public areas where its residents can involve themselves in many types of recreational and civic activities.
>
> A major example of such a park is located in New York City's Manhattan Island and is called Central Park. 'Commercial Interests' would leap for joy at any prospect to clear-cut Central Park, construct high-rise apartment and office buildings over the entire park area and reap huge profits from the commercial use of such prime real estate that is located in the middle of Manhattan Island. “

Our "playground" in the amateur radio service allows us to experiment with communications technology, have fun, and provide a valuable service to our community when such support is needed.

Members of the amateur radio community, in general, have highly developed technical skills which outmatch our communications counterparts in other types of services which are regulated under "Title 47" of the U.S. Code of Federal Regulations. The only exception would be communications technical managers or communications engineers who are employed with various local, municipal, county, special districts, federal agencies, or departments of the U.S. armed forces...

The flexibility in the use of the amateur radio spectrum, combined with the various modes which have been developed, and continue to be developed, allow members of this service to provide support to our communities in very creative ways in order to overcome technical problems that will occur during special events, and especially in post-disaster and recovery operations.

The technical nature of the amateur radio service provides a valid technical background for those who wish to advance in a professional career in such fields as land-mobile or marine or aircraft radio communications or avionics maintenance and repair, telecommunications, or radio broadcasting.

There is an installed base of thousands and thousands of amateur radio repeaters operating on the 10, 6, 2-meter, 220 MHz, and 70cm amateur bands. The vast majority of these repeaters have been placed in operation via the private efforts of individuals, and/or collective efforts of amateur radio clubs, official agencies, associations, and emergency volunteer groups such as ARES/RACES.

Since the mid-1970's there has been an effective means to coordinate the use of all of these thousands of VHF/UHF repeater frequencies so that there is little interference between repeater networks on the same, or on adjacent channels.

By general agreement individual amateur radio operators respect the fact that these repeater systems operate on a 24x7x365 basis on these coordinated frequency assignments.

There is a major fundamental difference between the Winlink2000/Airmail communications network and other types of digital operations within the amateur radio service which also operate on the HF radio bands.

This major difference is that the Winlink system is an installed network of redundant message servers, connected via the internet ***and*** HF radio base stations. This network was available during hurricane Katrina, and was instrumental in passing traffic to and from a disaster area which had suffered major outages of commercially infrastructure. Major failures occurred not only to land-mobile radio services used by public safety and local government agencies, but also the infrastructure used by cellular telephone, land-line telephone, radio, and television broadcasting...

HF radio messaging via the Winlink system was the exact solution that allowed amateur radio volunteers, and radio amateurs assigned to incident sites, temporary EOC's, and via client equipment in mobile units, to pass internet email via nodes that were located outside of the disaster area.

Normal communications transceiver bandwidths are required for the efficient delivery of message traffic between the radio user, the Winlink infrastructure, and the internet nodes which allow email traffic between someone in an EOC, mobile vehicle, or temporary operating site and the message recipient.

The Winlink network is **NOT** intended to be a "keyboard-to-keyboard" media for casual, live conversations. The Winlink network is also not a mode of operation, although it currently depends on Pactor-I, Pactor-II, and Pactor-III transmission protocols for efficient and timely delivery of message traffic.

Extremely narrow-band, soundcard-based, digital communications generally do not allow for large amounts of traffic throughput, nor do narrow-band sound-card modes allow for the required ACK, and NAK handshaking which is required for reliable message delivery between an Airmail client user and an email message recipient on the internet or in another mobile or temporary operating site.

Soundcard-based digital modes lend themselves very well to live chat, and low-traffic density communications between radio amateurs over degraded propagation paths, having noise and interference.

Soundcard-based digital communications lends itself well to keyboard to keyboard transmissions and can be used for file transfers via modes such as MT63 if run at wider bandwidths than those needed for typical 60 to 100 word per minute keyboard to keyboard communication.

Most teleprinter operations in commercial service were at speeds less than 110 baud, as the upper speed of a circuit was usually based on the typing speeds of the fastest "TeleType" or "Telex" operator on a typical circuit.

As traffic demands increased over time, additional bandwidth was needed for teleprinter operation over radio channels if multiplexing was used in order to have up to 12 separate teleprinter channels multiplexed over one HF fixed-service circuit such as were used up until the late 1960's by RCA, IT&T, Western Union, and commercial Telex services. Later, these types of point-to-point services moved their circuits to satellite, undersea cable, or undersea fiber-optic cable facilities.

Additional experimentation is always in progress within the amateur radio service as additional modes of communications transmission are created and used in real-time testing over various radio channel frequencies, and adopted as valid solutions in an effort to "...advance the state of the art."

An example of recent developments is on-air experimentation, and on-the-air use over the past seven years with Fed standard 1045 Automatic Link Establishment (ALE) networks by growing segment of the amateur radio service. ALE requires the bandwidth of normal amateur radio HF equipment of a standard SSB voice-bandwidth radio channel. At the same time, the value of channel monitoring, selective call, automated channel selection for connection to specific net stations, and the ability to run both voice and data transmissions over a channel once linked to another station with ALE capability, provides the ability to create a traffic net on a fairly ad-hoc basis when there is an agreed-upon list of net channels that can be placed on appropriate, and specific frequencies throughout the amateur radio spectrum.

Such innovative technical development efforts allow for major improvements in radio communications capability when the amateur radio service is seen in its role as operating in the public interest.

Respectfully submitted

(electronically)

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US Amateur Radio Bands

Effective Date
February 23, 2007

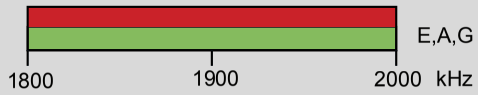
ARRL The national association for AMATEUR RADIO

US AMATEUR POWER LIMITS

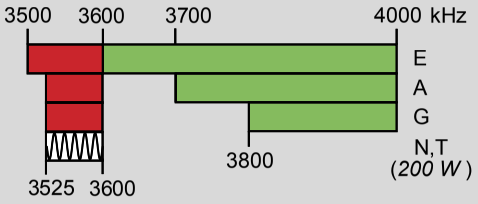
At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in watts PEP output. Except where noted, the maximum power output is *1500 Watts*.

160 Meters (1.8 MHz)

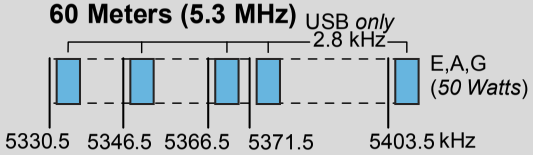
Avoid interference to radiolocation operations from 1900 to 2000 kHz



80 Meters (3.5 MHz)

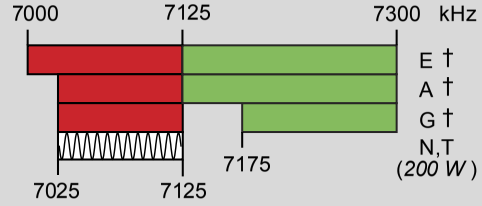


60 Meters (5.3 MHz)



General, Advanced, and Amateur Extra licensees may use the following five channels on a secondary basis with a maximum effective radiated power of 50 W PEP relative to a half wave dipole. Only upper sideband suppressed carrier voice transmissions may be used. The frequencies are 5330.5, 5346.5, 5366.5, 5371.5 and 5403.5 kHz. The occupied bandwidth is limited to 2.8 kHz centered on 5332, 5348, 5368, 5373, and 5405 kHz respectively.

40 Meters (7 MHz)

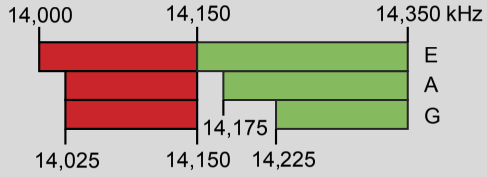


† Phone and Image modes are permitted between 7075 and 7100 kHz for FCC licensed stations in ITU Regions 1 and 3 and by FCC licensed stations in ITU Region 2 West of 130 degrees West longitude or South of 20 degrees North latitude. See Sections 97.305(c) and 97.307(f)(11). Novice and Technician licensees outside ITU Region 2 may use CW only between 7025 and 7075 kHz. See Section 97.301(e). These exemptions do not apply to stations in the continental US.

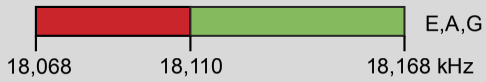
30 Meters (10.1 MHz)

Avoid interference to fixed services outside the US.

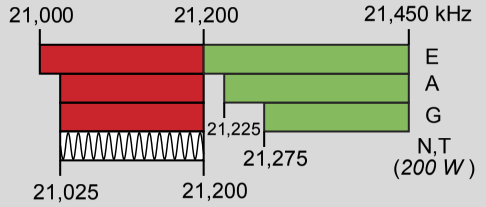
20 Meters (14 MHz)



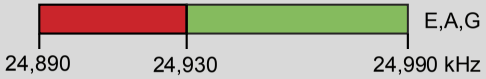
17 Meters (18 MHz)



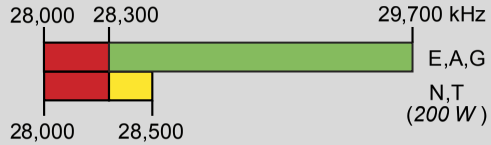
15 Meters (21 MHz)



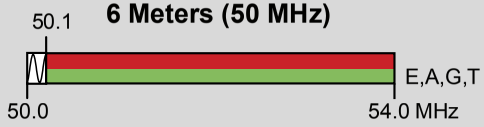
12 Meters (24 MHz)



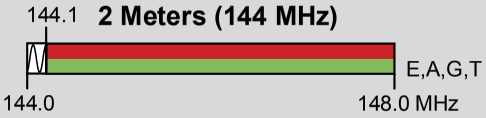
10 Meters (28 MHz)



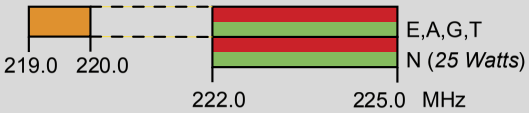
6 Meters (50 MHz)



2 Meters (144 MHz)



1.25 Meters (222 MHz)

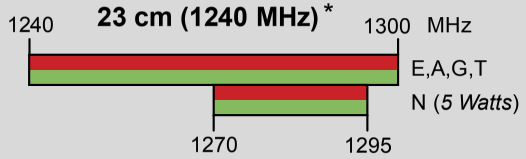


* Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

70 cm (420 MHz)*

33 cm (902 MHz)*

23 cm (1240 MHz)*



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

KEY

Note:
CW operation is permitted throughout all amateur bands except 60 meters.
MCW is authorized above 50.1 MHz, except for 219-220 MHz.
Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW *only*
- = SSB phone
- = USB phone *only*
- = Fixed digital message forwarding systems *only*

E = Amateur Extra
A = Advanced
G = General
T = Technician
N = Novice

See *ARRLWeb at www.arrl.org* for more detailed band plans.

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